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ADDRESS ON PHYSICAL TRAINING.

(Given at Johannesburg on Tuesday, August 29, 1905, Sir RICHARD C. JEBB, O.M., Litt.D., D.Ch., LL.D., M.P., in the Chair.)

By SIR LAUDER BRUNTON, M.D., F.R.S., ETC.

THE subject of physical training is a very large one, and may include the food and drink and general *régime*, as well as the exercises best adapted to improve the physique, but time will not allow me to take up more than the question of exercise. From time immemorial the threefold nature of man has been acknowledged, and has been expressed in the words body, soul, and spirit. Corresponding to these we have three kinds of education—physical, moral, and mental. In savage communities physical training receives most attention, for it fits a man for war, or the chase, and the results it produces are evident in the magnificent physique of such cases as the Zulus, which the British Association had opportunities of observing in the dances arranged for them in their recent visit to South Africa, by the kindness of the Hon. Marshall Campbell, at Durban, and the Municipal Authorities at Maritzburg.

The magnificent and beautiful cathedrals with which Europe is studded, bear witness to the importance attached to the care of men's souls at a time when learning was confined to a few, and most of the distinguished nobles and magnates were unable to write, and could only sign with a mark.

It is only of late years that the importance of a general knowledge of the three R's has become an article of belief, and like many new proselytes, we have been inclined in our care for the mind to neglect the body, and to neglect physical in our care for mental education. But mind and body cannot be separated. We do not know, and probably never shall know, the nature of the connection between body and mind, but there can be no doubt that the brain is the organ through which the mind works, and that a severe blow on the head, or

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the bursting of a blood vessel in the brain may completely destroy the most magnificent intellect, and reduce it to the level of the infant. The close connection between the mind and the body is also shown by a number of everyday observations. A person who is unaccustomed to read will often move his lips involuntarily, silently framing the words, and thus helping his comprehension of what he is reading. A child learning to write, puts out his tongue, because the nerve centres for the tongue and fingers adjoin one another in the brain, and the excessive action of the one spreads to the other. This close connection was recognised by the ancient Greeks, and I have been informed by one of the greatest authorities on the subject, Sir Richard Jebb, that during the most flourishing period of Greek literature and the highest range of Greek thoughts, not only was the winner at the Olympian Games regarded with the greatest admiration by the people as a very successful cricketer is at the present day amongst us, but that physical training was universal, every one having to go through it. It may be held that too much physical training interferes with mental activity and development, and no doubt excessive devotion to sport and exercise may have this effect, but this is a consequence of the abuse and not of the use of physical training, and Socrates thought no less philosophically because he had great powers of physical endurance, and would have gained a V.C. for the rescue of his friend Alcibiades if he had been serving now in the British Army. The Greeks have left us two models of physical development of entirely different kinds. The one is the Farnese Hercules, and the other is that of the Apollo Belvidere, and the sister statue the Diana of Versailles. The Hercules figures a man of enormous bulk with the muscles standing out like lumps upon his trunk and arms, yet he is leaning lazily, almost drowsily, on his huge club as if he could hardly support the weight of his own body. In the Apollo, on the other hand, we see a model of perfect symmetry, no muscles too large, none too small, every part of the body adapted to work harmoniously together, and co-operate with the eye in carrying out the dictates of the mind. In the Diana we see the same strength, lightness, pliancy, and



grace, the same fitness of the body to serve the mind, and not to encumber it, as it seems to do in the Hercules ; for the body reacts on the mind as well as the mind upon the body. Memory, one would say, is a purely mental function, yet it is markedly influenced by the body. Thus in a meeting such as the present, where one sees many new faces and hears many new names, one is apt to become bewildered and to forget names completely. But if we repeat the name, not merely silently with the lips, but aloud, we remember it better, because the mental impression made by the sound of the name is strengthened by the sensations felt in the larynx as well as in the lips and tongue. If we write the name down we are likely to remember it still better, for we have the muscular memory of the fingers in addition. I speak of muscular memory, but it must be remembered that the memory which originates in the movements of the muscles has its seat in the brain, the various parts of which may be compared to a man of business with a number of clerks and other employ es under him. When he has an entirely new staff they either do too little or too much, they get in one another's way and cause confusion. But when the business is properly arranged, each one knows what he has to do, and the master need only say to the head of a department do this, and it is done. We stand or walk, and are completely unconscious that in doing this almost all the muscles of our bodies are working together. If we try to bend a single finger whilst some one else tries to keep it straight, we can feel the biceps on the arm, and even the muscles in front of the chest, contracting at the same time, and the efforts of a child in learning to walk show us how difficult it is for the nervous system to co-ordinate the muscles so as to produce the proper movements. In children learning to write we also see the fingers cramped around the pen, which is firmly and almost convulsively held by them while the hand moves slowly and irregularly over the paper. It is only by practice that the mind learns how to regulate the muscles and make some relax whilst others contract. But as I have already said, the brain is the organ of the mind, and the proper performance of its functions depends on the circulation

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of blood through it. We see this in many people, who become drowsy and stupid after a heavy meal, for much blood being in their stomachs to digest their food, the brain is insufficiently supplied, and they cannot think. If, on the other hand, they force themselves to think after a heavy meal, they take the blood away from the stomach to the brain, and consequently their digestion suffers. A free supply of blood to the brain is needed for good mental work, and how can this be best obtained? You all know that a little exercise quickens your pulse, and the increased circulation thus produced quickens thought in many people who, like the peripatetic philosophers of ancient Greece, think best when they are slowly pacing to and fro. Others again will jump from their chairs from time to time, take a few hasty steps, and then sit down again to their desks. But the activity of the circulation depends to a large extent on the strength of the heart. Now the heart is just a hollow muscle, and it behaves like other muscles. Like them it grows stronger with exercise, but like them it may be weakened by over exercise and strain. The breathing too must be considered, for unless the blood is properly aerated it will not nourish sufficiently either the heart, the muscles, or the brain. What we need then is a system of physical exercise which shall develop the circulation and respiration as well as the muscles and the nervous system. By systematised movements and by the use of dumb-bells or clubs the muscles may be made large and strong like those of Hercules of old or of Sandow to-day. There can be no doubt of the utility of such exercises to a limited extent, for the circulation and respiration participate in the increased nutrition, so evidently shown by the larger size of the muscles, and thus the functional power of the brain becomes greater. Such exercises are of much use also in ensuring that no muscle is left inactive, but that all are called nearly equally into play, for such exercises can be easily modified so that any part of the body that tends to be insufficiently developed can be brought into action and its growth increased. The objection to such exercises is that there is a considerable amount of monotony attached to them, that pupils weary of them, and they then are regarded with aversion rather than pleasure. Now pleasure is

a most important element in everything which concerns the welfare of the body. The celebrated Russian physiologist Pavloff has shown that the digestibility of food depends on its palatability or tastiness as much or more than on its nutritive qualities; the same is the case with exercise: if it is wearisome and distasteful it does but little, but if it is enjoyed it does much good. Now the natural exercise of young people is games, and especially games of ball. The ancient Egyptians have depicted games of ball in those wondrous pictures, which are as fresh now as when they were painted, thirty-five or forty centuries ago. Homer tells how they were played and enjoyed by the Greeks, and they have lost none of their charm at the present day. In all their forms, cricket, baseball, hockey, tennis, lacrosse, &c., games of ball are probably more useful than any other, for they not only bring into play almost every muscle in the body, but train the nerve centres also to judge of the distance, position, and speed of the ball, and to co-ordinate the movements of the limbs accordingly. The best physical training, I think, consists in a combination of systematic exercises with games, so that the two may supplement each other. For girls' schools I should much like to see the carriage of a pot or calabash on the head introduced as a regular exercise, for the graceful carriage which this imparts to all the women who habitually employ it, whether they be Zulus, Egyptians, or Italians, is most admirable. Before concluding, I should like to mention the Japanese method of physical training, Ju-jitsu. This consists of exercises for children, women, and men carefully thought out and admirably adapted to their purpose. The training of men is to a great extent a system of attack and defence, which enables anyone proficient in it to protect himself (or herself) against the attacks of one or more strong assailants. I believe that before long this system will be taught to a greater or less extent in every public school.

The question, "Where does exercise end and over exercise begin"? is one which cannot be answered in general terms, for it varies not only with different persons but with the same individual at various times, and what would be quite insufficient

exercise for a man in his ordinary condition, would be excessive over exercise for the same person if he were just recovering from typhoid fever. The question can only be answered by medical examination repeated from time to time as required.

The problems of physical training and of other subjects connected with health in schools are now engaging much attention, and an International Congress for their consideration was held last year at Neuremberg. The next is to be held in London in the first week of August, 1907, and committees are being formed all over the world to prepare for it. Promises have already been received of the formation of committees in Cape Town, Durban, and Maritzburg, and I trust that Johannesburg will not be behindhand in this respect. We wish the co-operation of teachers, doctors, and all interested in the health and welfare of the rising generation, and if anyone is unable to obtain here all the information on the subject which he would like, he may have it by applying to the General Secretaries of the International Congress for School Hygiene, Parkes' Museum, Margaret Street, London, W.

I have already said so much about the utility of exercise and games as a part of education, that it seems almost unnecessary for me to express my admiration for the efforts of the Misses Laurence and Earle to associate games and bodily exercises with mental work in education, and to wish them most hearty success in their endeavours, as well as to thank them for the meeting they have organised to-day.

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